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By order,

MILTON V. KIDD,

Chief Clerk.

REPORT ON THE SURVEY

OF A

RAIL ROAD ROUTE

CONNECTING THE

City of Baltimore with Drum Point, on the
Patuxent River.

BY COL. GEORGE W. HUGHES,

CHIEF ENGINEER.

AN N A P O L I S :

WM. THOMPSON, OF R., PRINTER.

1868.



REPORT.

WEST RIVER, JANUARY 15, 1868.

HENRY M. WARFIELD, ESQ.,

President Board of Commissioners for the Survey of a Rail Road Route from Baltimore to the Mouth of the Patuxent River ;

SIR : The General Assembly of Maryland during the January session of 1867, passed the following joint resolution, (No. 9,) assented to the 12th of March of the same year:

“ Resolved by the General Assembly of Maryland, That the Governor be and he is hereby authorized and required to appoint one Commissioner from Anne Arundel county, and one Commissioner from Calvert county, and one from Baltimore city, who shall be authorized to employ an engineer to make a survey and to estimate the cost of constructing and equipping a railroad from Baltimore city, through Anne Arundel county to Drum Point, in Calvert county, or to some other point in said county, near the mouth of the Patuxent river, and report to the General Assembly as soon as practicable the result of said survey and estimate, together with the reasons that exist for the construction of said road and the advantages that will accrue to the State by the building of the said road.

“ Resolved, That the sum of five thousand dollars, or so much thereof as may be necessary, is hereby appropriated for making the said survey, and the Comptroller of the Treasury is hereby authorized and required to draw his warrant on the Treasurer, payable to such persons, and for such amount as may be required by the Governor.”

Under the authority of the above joint resolution, and for the purposes therein set forth, the Governor appointed Henry M. Warfield, of the City of Baltimore, B. Allein Welch, of Anne Arundel county, James T. Briscoe, of Calvert county, Commissioners.

REPORT.

On the 7th of May I was honored by the Board with the appointment of Chief Engineer of the proposed survey, and was directed to make immediate preliminary arrangements for its commencement; but we were met with unexpected financial difficulties, which necessarily postponed active operations for more than a month, at which time the wheat harvest was so advanced, and as our lines would for a long distance pass through a remarkably fertile and well cultivated region to the manifest injury of the growing crops, it was represented to the Board that a further delay was almost unavoidable. This suggestion was more readily adopted from the fact that the season had been, and was, at the time, unusually rainy, which unfavorable state of the weather continued, with few interruptions, during nearly the whole of July.

At a meeting of the Board in Baltimore on the 24th of July, the 6th of the next month was finally designated for the rendezvous of the surveying party at Millersville, the half-way station on the Annapolis and Elk Ridge Rail Road. In the mean while the party was organized, instruments, &c., purchased, and other preparations made for the prompt commencement of the work.

I may as well here observe once for all that the amount appropriated by the State, for this object (\$5,000) was obviously inadequate to an examination of the country as extensive, minute and satisfactory as was desired, and, perhaps, expected; but if a larger sum had been asked for, it is pretty certain that in the then condition of the Treasury nothing would have been granted by the Legislature. Under these circumstances we were limited to the formation of a single party. Nevertheless, it is believed that we shall be able to present a pretty clear idea of the country through which we passed, its leading features, character of soil, building resources, and general adaptability to the construction of a railroad, and a near approximation to a location, in trace, curvatures and gradients, length of road, cost of construction and connection with other public works. We were not able, however, to run as many different routes as we wished, nor to retrace and correct portions of our lines that would clearly admit of amendment, although in some cases, the most obvious, it has been done to advantage. Still, in not a few instances, this was not done for want of means, and occasional transit lines were run for topography, without the level, when it could be accomplished, so as not to delay our general operations.

The deficiencies in the instrumental surveys have been supplemented as far as possible, by extensive and careful reconnoissances by the Chief Engineer, during and since the period of field operations. In a word, our survey is to be regarded as strictly what is technically called "*Preliminary*," made with the view of collecting the data necessary for a definite location before letting contracts for the execution of the work. It is mainly instrumental, but combined with the results of personal examinations of the country in advance of the survey, and on both sides of it, within the probable limits of an actual location. These examinations have established the fact, to which more particular reference will be made hereafter, that the choice of ground for a railroad between the designated termini, is confined within rather narrow bounds, thus greatly simplifying the selection of a definitive line which, from that fact and the data collected by us, (shown on the maps and profiles, and embraced in this report,) will be a very easy matter, restricted mainly to the actual tracing of the location with reference to as near an equilibrium as can be established by excavation and embankment, and the reduction of the gradients as low as may be consistent with due economy in the cost of construction and the efficiency of the road when in operation; for the lower the grades and larger the radii of curvature, the less will be the wash of the road bed, "wear and tear" of rails and machinery, and cost of transportation. The curves will in no cases be abrupt, and the gradients may be arranged more favorably than on most railroads in this country, as will be shown in the sequel. If thought judicious, the steeper grades as now established may, in most instances, be reduced; or again, without seriously impairing the efficiency, and, if economy in first cost be an object, they may be considerably increased; but it must be borne in mind that low grades are always, when practicable, to be preferred, as it rarely if ever happens that they can be adjusted rigorously or even approximatively to the requirements of trade. As a general rule they must measurably conform to the features of the country and the amount of money that may be at command for the building of the road. It may be well here to remark that all changes and modifications of our line must necessarily be improvements, so that we do not really present the *project* in its most favorable aspects. Inasmuch as the proposition of a railroad communication between the city of Baltimore and the magnificent harbor at the mouth of the Patuxent river, from its inception, contemplated the use of the Baltimore and Potomac Rail Road from their intersection to the city; and inasmuch as that section had been carefully and minutely surveyed under the directions of that company, it was not thought necessary (and indeed, from the want of funds, was not practicable,) to carry our examinations to

Baltimore over the same ground. Besides this, under any circumstances, our connection with Baltimore can be established by a somewhat roundabout way, over the Annapolis and Elk Ridge Rail Road and a portion of the Baltimore and Ohio. And, again, it was thought advisable to select such a terminus for our road as to admit of its extension at some future day to a point that would give a more *facile* communication with the Cumberland coal-fields than by any existing means of transit. But this question will be more particularly discussed in another portion of the report.

It was therefore thought best to commence our survey near Millersville on the Annapolis and Elk Ridge Rail Road, leaving the establishment of our actual initial point to be determined by the crossing of the Baltimore and Potomac and the Annapolis and Elk Ridge Rail Roads, when that should be ascertained.

A pretty accurate knowledge of the country in which we were to operate, derived partly from surveys under my direction, when in the engineer service of the United States, for a Ship Canal from the District of Columbia to Annapolis; and, subsequently, for the Annapolis and Elk Ridge Rail Road, and a long residence in Anne Arundel, enabled me to digest a plan of survey with much confidence, and thus to avoid a good deal of unnecessary labor. At the same time it is to be regretted that we could not avail ourselves of the surveys of the Baltimore and Potomac Rail Road, a portion of which might have been useful to us in the beginning. I am happy to say, however, that we received a good deal of assistance from "Martinette's" Maps of Anne Arundel and Calvert counties, that proved to be more accurate than such maps usually are, and were quite reliable as guides to the county roads and general course of the streams. From them and the "Survey of the Coast" has been drawn the skeleton of our maps, on which has also been traced, from the latter, the lower Patuxent, the soundings at its mouth, and the Bay line of Calvert county.

The Ridge, or rather "Plateau," dividing the drainage between the Patuxent and the streams flowing into the Chesapeake Bay, is, in its entire length, quite narrow, although of variable width, and preserved a remarkably uniform elevation, with occasional depressions, and in Anne Arundel occupies nearly a central position between these waters, but, in Calvert, is more sinuous and broken, inclining rather towards the Chesapeake, until, in fact, it forms "The Cliffs," rising directly above the Bay, forcing nearly the whole drainage of the peninsula into the Patuxent, and then scarping out wide deep valleys, through which flow streams of considerable magnitude in the rainy season, navigable at all

times for several miles above their mouths. After passing "All Saints" Church, the ridge divides into two parts, nearly parallel to each other, of almost equal altitude, but separated by wide and deep ravines, for our objects impassable, and do not re-unite, until a point is reached a few miles beyond St. Leonard's. The western of these ridges is the more direct, and in every respect the best adapted to our purpose. It is cut transversely at two points, viz: by "Hunting Creek" and St. Leonard's Creek, running to the Patuxent, whilst the Eastern Ridge is similarly broken through by "Parker's Creek," flowing into the Bay. In these three cases, the streams, where they cut the highlands, have sunk nearly to tide level. The determination of the direction of the flow of water, accumulated in the lateral valleys, which burst through their barriers, was, probably, accidental, or, perhaps, due to a difference in the tenacity of the soil, as it could not well be attributed to any material variation in the elevation of the two ridges.

This Plateau, or "Water Shed," is, in reality, a topographical continuation of "Parr's Spring Ridge," although entirely different from it in geological structure. It may be said, properly, to begin where the latter falls off, near the Savage Factory, where the geological features suddenly change from a primitive to a tertiary formation. The entire country traversed by our survey was evidently at one time, and for a long period, submerged, as is shown by its large deposits of oceanic, organic remains and other indications; and its present condition is probably due either to elevating forces in the interior of the earth, or to the subsidence of the waters. And it is indeed not unlikely that it has been frequently subjected to such changes, its topographical characteristics having been, since the period referred to, gradually modified by constant abrasion, still feebly in action. Throughout the whole extent of this "*Divide*," the heads of small streams and ravines interlock and fall off very rapidly, forming, near their sources, wide and deep valleys, separated by lateral ridges nearly as high as the "Back Bone," but becoming very sluggish in approaching their *debouches*: that is to say their principal fall is within a few hundred yards from the main ridge, where they become as it were great gulfs, not much above the level of tide. This description, whilst measurably true of the whole ridge, is more particularly applicable to that portion of it lying in the lower portion of Anne Arundel, and the entire length of Calvert. A more particular account of the country will be given when we come to a minute consideration of its surface, in relation to the lines of survey and the plan of location.

From what has been said above, it will be seen that our surveys were really limited to a narrow breadth of land,

whilst within these limits there was often much room for selection ; and sometimes it became necessary to run lines, or to make extensive personal reconnoissances, to demonstrate their impracticability, in order to satisfy preconceived opinions, and to leave no reasonable doubts that we were at least approximating to the true route. The belief was entertained by many judicious persons, based on a rather limited local knowledge of the country, that the better route, at least as far as Friendship, if not further, would be found *near* the Patuxent, which, for a long stretch in Anne Arundel county, presents a wide, almost level, sandy plain, evidently once the river bed, but which, on examination, was found intersected by numerous streams, often deep and wide, and towards Bristol, and into Calvert, very rough and broken. Whilst a considerable portion of this line was favorable, and indeed for most part from near Millersville, to the vicinity of Bristol, (objectionable only on account of bridging of streams,) great and almost insurmountable difficulties would be encountered in carrying a railroad to Friendship, which, owing to the peculiar configuration of the county, must almost necessarily be regarded as a fixed point in any railroad leading down the peninsula. In consequence of these ascertained facts, and for other reasons not necessary to refer to again, no instrumental surveys were made by us in that section. I understand that General Trimble, many years ago, surveyed a considerable portion of that route, extending from Millersville, in connection with his other surveys, to the crossing at Green Landing into Prince George's county ; but the real difficulties are to be met much lower down. I cannot hesitate to say that a road closely following the valley of the Patuxent to Drum Point, is impracticable, except regardless of cost.

In accordance with previous arrangements, the engineer party assembled at Millersville in the course of the 6th of August, but the instruments did not arrive till the next day, which was occupied in testing them and instructing the men in the discharge of their several duties ; so that the work did not fairly begin until the morning of the 8th.

The corps consisted, besides the Chief Engineer, of two Assistants, of two Rodmen, two Instrument Carriers, two Flagmen, two Chainmen, two Axemen, and a Quartermaster, who also acted as Commissary and Agent, making in all fourteen persons employed.

The best and most economical means of subsisting the party and transporting the baggage, was early a question of considerable importance and interest. To purchase a wagon, teams, tents, camp equipage, and a stock of supplies, would have involved not only the hire of two additional hands and

forage for two more horses, but would have made a heavy draft, in the very beginning, on our small fund, already much diminished by the purchase of instruments and other necessary materials. Besides this, it was believed that many persons living near the line of road, and deeply interested in the survey, would cheerfully contribute something towards it in the way of accommodating the men, and in that expectation we were not disappointed. The well-known hospitality of Southern Maryland was not relaxed on this occasion; many gentlemen, although pretty severely taxed by our requisitions, would receive no compensation, and others who could not afford to board our large party for nothing were, generally, satisfied to receive less than a fair remuneration. It is true, that some inconvenience and loss of time were experienced in going to and from work night and morning, but it is believed that on the whole, the plan adopted of trusting to the people of the country for accommodation was economical and judicious.

Mr. *Charles Ashe* was assigned to the *Transit* instrument. Mr. *H. H. Brogden* to the *Level*. Both of these gentlemen had had much experience in the use of instruments and in practical engineering, so that I had reason to repose confidence in the accuracy of their results, which I am happy to say I have no cause to distrust. Many portions of this report are necessarily based on that confidence, which it is believed will bear the test of strict scrutiny.

Our survey was begun at an old bench mark, on a mulberry tree, of the Baltimore and Potomac Rail Road Survey, near Millersville, at an elevation of 138 feet above medium tide,* affording a direct connection with that road, at whatever point it may cross the Annapolis and Elk Ridge Rail Road. It then proceeds in a southern direction, nearly parallel to an abandoned section of the Baltimore and Potomac Rail Road, graduated in 1866, as far as Dr. Hammond's, crossing a narrow ridge just east of his house, over most favorable ground, and then by a slight eastern deflection, passes close to the head of a deep ravine, draining into South River, but still keeping in the valley of the Patuxent, thence on, near a tobacco house belonging to Mr. Basil Hall, and not far from his residence; and further on, close to that of Mr. Johns Hopkins, the ground is still well adapted to our purpose, but soon after leaving Hopkins it becomes broken by draining into the Beaver dam creek, a considerable tributary to the Patuxent. From this point a trial line was run to "Brightseat," across the creek, but unsuccessfully.

* There is a considerable depression at this point, affording a good line to the Severn River for the contemplated Ship-Canal from Washington City to the Chesapeake Bay.

From this place we ran back on a favorable line connecting with the Baltimore and Potomac surveys, not far above "Conway's" Store, determining a low depression in a high lateral ridge near Hopkins', through which we can get a more direct and better location than that which was surveyed, keeping nearer to Mr. Richard Anderson's. (See map.) The *back* line was not on precisely the ground I had indicated. It ought to run near a tobacco house in front of Mrs. Linthicum's. To "Brightseat," over four miles the gradients are low, with little graduation, and no masonry, with the exception of a few small drains, but will require a wooden truss bridge, of 20 feet span, to cross "Beaver Dam." After leaving "Brightseat," our line ascends to the general level of the "Watershed" by a short grade of 36 feet to the mile, passing between the residences of Mr. J. Linthicum and Mr. James Hopkins, taking the general direction of the county road to Davidsonville, and thence on a direct course over the ridge at its lowest depression, on which stands the house of Mr. T. Hodges, from which point, with a gentle eastern deflection, it reaches the farm of Mr. Thomas Kent, keeping a little to the west of his house; again, with a slight western deflection, it reaches Davidsonville, at a distance from Millersville of precisely ten miles, forming the first natural division of the road. For a short distance before reaching Davidsonville, where we attained an elevation of 180 feet above tide, the ground on Mr. James A. Iglehart's farm is much broken.

A reference to the map and profile will show that thus far our road will be a cheap one, the grades low, the ground, with few exceptions, favorable and of easy excavation, as there is *no rock or hard pan* to be encountered. This remark is equally true of our entire line, the soil in most portions of Anne Arundel being a clay loam, and in Calvert either the same or sand and gravel. This division will require nothing but a few culverts, generally small, and one wooden bridge of 20 feet opening; most of the drains will be of wood, and indeed all of them may be. The estimated cost of constructing these first 10 miles is \$180,000, exclusive of Rolling stock.

From Davidsonville to Stocket's Run, a considerable tributary to the Patuxent, and scooping out a wide deep valley, the ground is much broken, and near the Run, falls rapidly, involving a bridge over the brook, several culverts and a good deal of graduation. From the bed of the stream it rises pretty rapidly and is also broken till it reaches the neighborhood of Butler's Tavern. This section of 4 miles will however admit of much improvement, especially through the Doden estate, possibly running to the east of Dr. Richard S. Stewart's house, and from Stocket's Run, keeping in front instead of the rear

of Dr. Steel's, not far from the Presbyterian Church on Marriott's Hill, which will bring the line on very favorable ground to the vicinity of the Cross Roads (Mount Zion,) over the farms of Hamilton, Marriott, Woolen, Richardson and Welsh, on to the estate of the late Henry Hall. There is then a short section much furrowed by ravines on the land of Mr. James Cheston, jr., which brings us on a long stretch of most favorable country, extending almost to Friendship. I will here remark that before a location is selected, a careful survey should be made from near Mr. Thomas Richardson's (old) house, toward Mt. Zion Church, then to the right of the school house at the Cross Roads, towards the head of a ravine on the Lothian farm, but not leading into the ravine itself, keeping to the east of it and passing to the west of Hamilton Hall's and John F. Wilson's, and uniting with our line below St. James' Church. The ravine referred to above, drains into Lyon's Creek, the largest tributary to the Patuxent in Anne Arundel, and falls off rapidly from its source into a deep narrow valley, through which flows a considerable but rather sluggish stream. It has been suggested that this valley would offer an eligible railroad route, but in my judgment is objectionable for many reasons. We could not run on the slope of its banks, which are much gullied, nor could we reach its bed without a very steep grade; it is very crooked and would take us much out of a direct course, and I cannot but think that it is subject to periodical inundations.

But to return to our main line. After passing the rough ground referred to above, we come upon the Tudor estate on a level and long extended plain, requiring scarcely any graduation or drainage, with uniformly descending grades, sometimes nearly level, always gentle and never exceeding 21.06 feet to the mile, just before reaching the end of the twenty-first mile, Lyon's Creek, (in the valley of which we have been running since leaving St. James' Church) turns suddenly to the west and we leave it altogether, following, however, with an easy ascent, one of its laterals for a short distance, passing close to Atwell's and thence over Gravelly Hill at the twenty-second mile, on the farm of the late Captain Grover, near the junction of the roads to Fair Haven, and to Friendship, thence by a slight descending grade to the bed of a little stream flowing into Lyon's Creek, from whence, availing ourselves of a small lateral valley, we ascend, passing near to Dr. Carr's, to a depression in the ridge a short distance to the south of the village of Friendship, at an elevation of 137 feet above tide. There is another route by which we might reach the outskirts of the town at a lower depression, but it is doubtful whether the line ahead would prove to be as favorable as that which we selected; but still it is worthy of further examination.

In regard to the above line from Mr. Hamilton Hall's to St. James' Church, I will here observe that, owing to a misconstruction of my orders, a portion of it was not run on the ground I had indicated; and the change was undoubtedly for the worse. It was my intention that the survey should have been carried just in front of Mr. J. F. Wilson's house, which would have given a shorter line, fewer curves, lower grades, much less work, and admitting of a better distribution of the fall. In fact, I believe that this portion of the line may be established with grades not exceeding 15 feet to the mile. It is true, we shall have to cross a considerable valley draining into Lyon's Creek, but it is not as formidable as was represented at that time; for, subsequently, I rode over it without much trouble. It is not over 100 feet wide, with smooth ground on both banks.

We have now reached *Friendship*, near the Calvert county boundary, at the end of the 23d mile from the point of beginning. From Davidsonville to this place, 13 miles, will naturally form the second division of the road. In reviewing our progress thus far, I feel confident that facts will sustain me in saying, (with the modifications suggested and others that may be effected,) that few lines of equal extent can anywhere be found more favorable as regards directness of course, grades, radii of curvature, and cost of construction, traversing a section of country unsurpassed by any portions of Maryland in fertility of soil, salubrity of climate, and density of population. I cannot doubt that when a railroad is opened successively to Davidsonville, Mount Zion, Cross Roads, and to Friendship, it will be a paying road, without regard to a further extension. Height above tide, 149' 5". Estimate for road bed complete, \$200,500 to this point.

After leaving Anne Arundel county, $1\frac{1}{2}$ miles beyond Friendship, we enter upon a section more difficult than any we have met with, much broken by the draining of Hall's Creek into the Patuxent, and further on, by a stream flowing into the Bay. Here, for the first time, the continuity of the dividing ridge is broken, or rather greatly depressed. We have therefore to descend, and again to ascend by steep grades, to attain the level of the ridge. The summit at Mount Harmony, opposite Mr. R. Howard's house, 188 feet above tide, encountering much difficulty and involving heavy work in graduation, bridging and masonry. These difficulties cannot be avoided, although they may be lessened, as any considerable departure, either to the right or the left, will but increase them. Still the line may be improved. From Friendship a right line takes us through a depression in the ridge, on which stands the residence of Mr. Thomas Owens, when a deflection towards the South leads to Hall's Creek, in a deep but not very wide valley. Crossing this stream we

ascend a ravine to the rear of Henry Owings', which carries us to high ground near a tobacco-house belonging to him, and thence over very broken ground to Mount Harmony, on the summit of the ridge. From the crossing of Hall's Creek to this point, $1\frac{1}{2}$ miles, the grades are generally quite steep, the highest varying from 68' 8" to 75' 5" to the mile, requiring a wooden bridge 25 feet span at the creek, and three pretty large culverts. (See map, profile and estimates.) I have no doubt, from personal examination during and since the survey, that this section, difficult as it must needs be under any circumstances, may be improved in every way, especially in regard to gradients, and, I believe, in amount of work. It would be better to keep more to the west of Mr. Henry Owings', running up a ravine that promises an easy grade, and passing between Mrs. Gibbon's (marked B. Dowell on the county map) and a tobacco-house at the forks of the roads, and crossing a ridge just south of Mount Harmony Church, reuniting with our survey a short distance beyond.

From this point on, passing through Sunderlandville, close by the old burial ground of All Saints Church, between the Rectory and Mr. Wilkinson's, through the farm of Mr. J. T. Turner to Dr. Stanforth's, a distance of five miles, the route may be described as favorable, and the latter half of it extremely so, with very gentle grades, requiring but little work of any kind. As far as All Saints Church the ridge is very narrow, sinuous and considerably broken, falling off rapidly on either side of the divide, and immediately forming wide and deep chasms. We had, therefore, to confine ourselves to this ridge, which is also occupied by the main road down the country, and to follow it in its windings. The country is not, however, (as has been already said,) unfavorable, but will require much care and labor in making a proper and judicious location, I again refer to the accompanying drawings for more minute information. After leaving the thirty-first mile (beyond Stanforth's) we encounter a high and rather wide ridge, 149 feet above tide, which the formation of the country will not permit us to avoid, as it is broken on both sides into formidable ravines that necessitate a short grade of 62.06 feet to the mile, in order to reduce the amount of excavation. The highest point on this ridge is at Huntingtown, near the store of Messrs. Norfolk, 177 feet above tide. It is from this point, the end of the thirty-second mile, that we commence to descend to Hunting Creek, one of the most formidable obstacles in our whole line of road, not only in reaching the creek, but in ascending to the general level of the ridge on the other side. It is here that the ridge is cut through, as described in another portion of the report, transversely at nearly tide level; indeed, at extreme spring tides the water

flows back above our point of crossing, and the creek is navigable to within a mile of it from the Patuxent River. This creek has a large area of drainage, and forms with its different tributaries wide, deep valleys, through which the water flows with but little current. As we approach the creek the country is washed into numerous and deep gulleys, ramifying in all directions from the "watershed." By somewhat elongating our line, and not hesitating to encounter some lateral ridges and a good many ravines, and throwing a wooden truss bridge 50 feet high and 600 feet long, we can get down with grades not exceeding 55 feet to the mile.

It will be worthy of future consideration whether the line may not be varied to advantage by running considerably to the East, diverging from Norfolk's Store. It may be that a more satisfactory location can thus be obtained, but the crossing of the creek must be that which we have selected, unless a much better line might be found by diverging at a ridge above Mr. J. Norfolk's residence, keeping west of the county road and running near Mr. Wilkinson's, bridging the creek somewhat below the crossing of that stream by the county road. This would certainly give us more favorable ground with an easier grade south of Hunting Creek. But in truth the whole of this section, from Huntingtown, (Post Office) will require careful and laborious revision before the best line can be selected. The height of the bridge might possibly be lowered without materially, if at all, increasing the descending grade of 55 feet; if it were not for the steep ascent on the other side to Mr. Morton's tenement house, which, with the 50 feet elevation of the bridge, still forces us to adopt a grade of 62 feet to the mile. From Morton's to Prince Frederick, 149 feet above tide, the seat of justice of Calvert county, passing through the farm of Dr. Macdaniel, and not far from his house, near Mrs. Sollers', and in close proximity to Foutz's blacksmith shop, there is no serious difficulty, the work is in general light and grades low, there being but one of 27 feet near Dowell's blacksmith shop, on the verge of the town. If the line surveyed beyond this around the head waters of Parker's Creek should be adopted, that portion of the survey from near Mrs. Sollers' to the town might be varied, keeping to the west of the tobacco house near Dowell's shop. At this point heads a deep ravine, similar in character to those already described, running into Sullivan's Branch of Parker's Creek, an affluent to the Chesapeake Bay. The main road leading to Port Republic, St. Leonard's and the mouth of the Patuxent, crosses the stream not much above tide, a short distance below Prince Frederick; but the valley is not quite as deep, and much narrower than that of Hunting Creek.

This is the second stream cutting the ridge transversely, as before stated. After a personal reconnoissance of this region, it was thought best to run the survey around the head of Parker's Creek Basin. But on further and repeated personal examinations, I am by no means certain that the direct route passing from Dowell's to the rear of the jail, and keeping on the east slope of the valley above the heads of the secondary ravines, following the general direction of the mail road and crossing the creek by a high bridge, may not prove to be for many reasons the preferable route. There would be, however, two pretty serious obstacles to encounter on this line. First, a high and rather broad ridge on the farm of Mr. Wm. Parran, and second, the bridging of Parker's Creek. The descent from Parran's to and the ascent from the creek would be favorable, and the surface of the country not much broken. Which of the two routes, *everything being taken into consideration*, will turn out to the better, can be settled only after more complete surveys.

The opinion has been entertained by many intelligent gentlemen of much local topographical information, that we would have done better by bearing more to the east from the vicinity of All Saints Church, until we fell into the main branch of Hunting Creek, which is represented to head not far off, and there following down its valley to near where we crossed its stream; and then ascending a secondary valley, nearly as large as, and similar in character to, the main valley which drains from the farm of Mr. C. Somersett Parran, (a short distance from Prince Frederick,) between Dr. MacDaniel's and Col. L. Skinner's. The objections to this route seem to me so formidable that I cannot venture to recommend it. If it were adopted, it would become absolutely necessary to occupy the bed of the valley, which could not be reached with a less grade than 100 feet to the mile, for its banks are so steep and so "gullied" or washed, that the grades could not be distributed with any regularity along its sides, and at every few rods, wide deep ravines would have to be crossed. These two valleys fall soon after leaving the high grounds, most sluggishly at an average rate, not exceeding probably five or six feet to the mile. Then to attain a sufficient height to cross Hunting Creek and enter the valley of its tributary, would require a long embankment on both sides of the creek. To leave the low ground and attain a level on the ridge, (which we must do,) would require as high a grade as that by which we descended; and above all, both of these valleys must needs be subject (judging from appearances, and the extent of drainage,) to periodical inundations. The county bridge just below our crossing place, was carried away by the floods of last spring. I do not believe even that it would prove to be as short as the line we sur-

veyed. Our line was carried on from Dowel's to the west of the ravine, before alluded to, passing in front of St. Paul's Church, and then turning more southerly near Mrs. Dalrymple's, and afterwards gradually easterly, avoiding as far as possible, the gulleys running into Parker's Creek; but found that without bearing too much westerly out of our course, we had to encounter at the fortieth mile a considerable depression. A still more abrupt deflection toward the east, brought us into the main county road to Port Republic, at Mr. Boyd's. Here the two routes from Prince Frederick would unite. From this point, on passing through Port Republic, General Parran's farm, and Captain John T. Bond's, to the end of the forty-seventh mile, the country is very favorable, and very little work will be required, and not much correction in the survey. At a point not far beyond Capt. Bond's, where the direct and principally traveled road to Drum Point, crossing the St. Leonard's, near the head of tide and the Cliff road, bearing towards the bay, and turning the head waters of St. Leonard's Creek, diverge two routes here presented to us, reuniting at Wilson's wind-mill. This point of separation is on the "Glebe," in the occupancy of the Rev. Mr. Christian. After a careful reconnaissance, it was determined to run the line following the cliffs. But the other route was also surveyed from the wind-mill to Mr. Christian's, crossing the St. Leonard's near and above the post office.

At the termination of the 47th mile new difficulties of a formidable nature meet us. The area of drainage of the St. Leonard's is large, commencing but a short distance from the Chesapeake Bay, the watershed being very narrow, forming what are appropriately called "the *Cliffs* of Calvert." These cliffs we are necessarily compelled to follow in all their windings, keeping, however, rather in the drainage of the St. Leonard's, but occasionally falling into that of the bay. At the end of the section before described there occurs a depression of the "divide," that can not be altogether avoided, and which requires a heavy embankment in order to lessen the grade at the other end, when we again ascend to the average level of the watershed. The ground for about one mile ahead is much broken, distorted and gullied by washes, forming short, abrupt ridges separated by deep ravines. The survey follows the general direction of the county road, frequently crossing it, and never leaving it for any considerable distance. Our line runs in front of Mr. J. Robinson's, and in the rear of his tobacco house, on the road, and thence by S. Weems and John Dowell's, where we reach the highest elevation of the ridge. To attain this point we have adopted undulating grades of 38' 17" and 52' to the mile. From hence to the end of the fiftieth mile, at Wilson's Wind-

mill, near the forks of the road to Drum Point and St. Leonard's, the ground is less unfavorable, but still more or less broken. But here all serious difficulties terminate. The St. Leonards line may be greatly shortened, and the grades reduced. At the end of the last section, the route from Mr. Christian's through St. Leonard's unites with the main line. It is less sinuous and broken, the ground being on the whole favorable, and a little shorter, better curves with lower grades and much less excavation and embankment than on the Cliff line. It may be made nearly a mile shorter, but then it will require a high and long wooden bridge to span the creek, the bottom of which is soft and deep. This branch is susceptible of great improvement over the surveyed line.

It would probably be cheaper at *first cost* than the other, and in many respects preferable, but all wooden bridges are objectionable when they can be avoided, not only on account of safety, but also on that of "wear and tear."

The estimates, including bridge, are somewhat greater on the line run. We have not sufficient information in our possession to say positively which route ought to be adopted. It is sufficient for our present purpose to know that both are practicable with a reasonable expenditure of money. It would be better, however, for the accommodation of the people, that the road should be kept as far from the bay as the nature of the country will permit. For more detailed information, I again refer to the maps and profiles.

From the forks of the roads above mentioned, our survey proceeds past Mr. J. Gray's, N. Dare, Sr., beyond whose house the ridge is just wide enough for the county road, (whose bed we occupy for a short distance,) but falls gradually both ways, when we reach a long stretch of level country passing between Mr. W. Bowen's and the county road, and thence on to the eastern enclosure of the Protestant Episcopal Church to Mr. Lusby's store; from whence it again deflects towards the bay, in order to avoid the complicated system of drainage into the Patuxent at its mouth. This portion of the country is much intersected by water courses, many of them (all of them at their mouths) tidal. We again follow the direction of the main road to Drum Point, passing by Mr. H. Thomas' near the road leading to Point Patience, on the Patuxent, and thence through the lands of Mrs. Buckler, Messrs. Leathering and Fowler, and Mrs. Ridley, to Mr. James Humphrey's. From Leathering's to Humphrey's the ground is rough, but from thence on to Drum Point it is so generally favorable and little variable in character, as to call for no particular description. This line was terminated at tide water at the mouth of the Patuxent river, on the es-

tate and near the residence of Capt. Fitzgerald, of the well-known mercantile firm of Fitzgerald, Booth & Co., of the city of Baltimore. The whole length of the line from Millersville is 59 miles, 3,104 feet. The bank of the river at our terminus is 45 feet above tide. I am satisfied that the length of a location need not exceed 55 miles, which I shall assume as the distance.

After finishing the survey to Drum Point, we returned to Lusby's Store, and ran another line terminating at Point Patience, on the Patuxent just above Solomon's Island, at very deep water with bold shores, forming, with the island a safe and commodious harbor, but in rigorous winters closed with ice. I am assured that it is usually accessible for ships, but not at all times. This branch road would be about a mile shorter than the one to Drum Point, and on rather more favorable ground. The length from Lusby's Store is five miles, 161 feet. It has been suggested to me since the survey was closed, that probably the best route of all would be found by leaving the Point Patience line at Mr. Tucker's, and crossing the head of Mill Creek near Mr. T. J. Connelly's and uniting with the direct Drum Point line not far from Mr. S. Ward's. This line might perhaps diverge nearer to the forks of the two roads, say at Mr. B. Evans'. If this should be a feasible line, it would somewhat shorten the distance, as being intermediate to the two main lines as surveyed, but I fear it would encounter very broken ground. I would nevertheless have examined it if the suggestion had been received in time.

The distance from Point Patience to Drum Point, measured on the deep or ship channel, is $4\frac{1}{2}$ miles, in which the shallowest water is $8\frac{1}{2}$ fathoms or 51 feet. The least depth over the bar at the entrance to the river is $4\frac{1}{2}$ fathoms or 27 feet at medium tide, the mean rise and fall at Spring tides being 1', 9", and the highest observed 3', 1". The width at the entrance between Drum Point and Hog Island is $1\frac{1}{4}$ miles. The greatest width about half way between the Point and Solomon's Island is $2\frac{1}{2}$ miles between the shores, on which the breadth of water varying from 21 to 27 feet—that is at the two edges of the channel—is $1\frac{1}{2}$ miles. From Sandy Point (on Solomon's Island) to the St. Mary's shore it is $2\frac{1}{4}$ miles; at Town Point $\frac{3}{4}$ of a mile, and at Point Patience about the same width.

The water close to the latter point is as deep as any portion of the Haven. This constitutes "the harbor of the Patuxent." In reference to it, Captain Muse, of the Navy, says, as quoted by Professor A. D. Bache, in his Coast Survey Report for 1857: "Vessels of any size can enter and be

protected here." "Higher up, (above Point Patience,) the channel is sufficiently deep, but too narrow for vessels of a large size." The whole harbor affords good anchorage. Some further remarks on this subject will be found in a subsequent part of this report; and those who desire more information about it are referred to chart No. 13 of the Coast Survey Report for the year 1859, and other published maps from the same source. The "mouth" may be properly considered as forming two large harbors. The first and largest, and at all times accessible, between Drum Point and Solomon's Island; the second, between the Island and Point Patience, occasionally—once in several years, and for a few days only—closed with ice.

By referring to the minute and elaborate estimates herewith submitted in tabular form, it will be seen that we calculate the cost of constructing a railroad from Millersville to Drum Point, on our line of survey, at \$1,327,542, and for *stocking* it at \$127,950, making a total of \$1,455,492, complete in all its parts and in good working condition.

The prices adopted in the estimates for excavation, embankment and extra hauling, and wood and brick structure, are rather higher than similar work is now done for, and may be expected next year to be considerably reduced. And when it is borne in mind that our calculations of *quantities* are based on an *experimental* survey, subject to great improvements in a location, they must *necessarily* be in *excess*. Besides this, I have always believed that the estimates of an engineer should be very liberal, so as to certainly cover all contingencies and avoid disappointment in the future, and that they should be regarded as strictly confidential, leaving all bidders to form their own judgment as to the prices for which they can execute the proposed works; but at the same time giving *all the elements*, in great detail, on which safe and sound opinions may be founded.

I have said elsewhere that the road may be shortened to 55 miles. The above estimate of the road bed complete, is on an average (in round numbers) \$22,122 per mile. The reduction in distance diminish the estimates \$110,610, leaving a total for the road bed \$1,216,932. The rolling stock estimated for, consists of 2 locomotives of 25 tons, 2 of 15 tons and 1 of 12 tons, 7 first class passenger cars, 12 second class, 5 express, 40 box and 60 platform cars. This is probably more stock than would be required for the first year. They are put down at current prices. In many instances wooden trunks may be substituted for brick culverts, where the pressure of the embankments is not too great. They have been found lasting (and of course economical) on some of the oldest and best railroads in this country.

The estimates for graduation are based on a road bed, in embankment of 10 feet at top, and in excavation of 14 feet at bottom, but this has not been invariably adhered to, the dimensions having been increased where circumstances rendered it desirable without much additional cost. The slopes being generally $1\frac{1}{2}$ to one throughout the line, which experience shows to be a slope but little liable to wash; the nature of the soil being favorable to the preservation of the road bed both in excavation and embankment. We have sand and gravel generally near at hand for ballasting.

There is no stone of any account near our line, but a great abundance of excellent wood for building material, (where it can be advantageously employed) and for cross ties. In other cases stone from Port Deposit or bricks will have to be resorted to. The latter may be burnt on the line of road or landed at a short distance from it, shipped from Baltimore. The rail is assumed at 56 lbs. per linear yard. Taking everything into consideration, and being fully sensible of the responsibility I assume, I do not hesitate to say that the road can be built and equipped in perfect running order with sufficient water stations, depots, sidings, turn-tables, &c., for a sum not exceeding \$1,300,000. But this does not include the right of way, an item always difficult to ascertain, beforehand, but which it is believed would be very small in this case, as all the land owners on our route understand too well their interests in the project to interpose any selfish obstacles to its execution, for on its success their future prosperity in no slight measure depends.

The questions are often propounded by those deeply interested in their satisfactory solution, whether the work is likely to be constructed, and if built, whether it would become a paying road? After a careful consideration of them in all their bearings, and with all the information we have been able to gather in relation to them, I do not hesitate to say that the proposed road is so important in itself and in connection with other public improvements, I believe it will be built at no distant day, but *when* is a *question of time*—a most important question, however, for the people of Anne Arundel and Calvert counties, and one to which I sincerely regret, I cannot give a more definite answer. It must depend entirely upon the manner in which the project is received when submitted to the public. At this time it is the only possible answer that can be given; although it is hoped and believed that the facts and statements which we shall be able to present, will not fail to attract the attention, and receive the favorable consideration of capitalists, and of those communities and individuals most deeply interested, in opening this new communication with the sea, through one of the most magnificent harbors in the United

States, pronounced by the late Professor Bache, to be, if not the first harbor on our coast, certainly inferior only to that of Portsmouth, in New Hampshire.

It seems scarcely possible to suppose that, in this utilitarian age, so fine a sheet of water as that at the mouth of the Patuxent, within Drum Point; so near to the open sea; so accessible at all times, even in the severest winters; where hundreds of large ships may lay safely at anchor, protected from winds from every quarter; surrounded by a rich, healthy, and well cultivated country; with bold shores, bordering a beautiful plain more than a mile wide, (rising beyond in gentle undulations,) presenting a picturesque and charming site for a large town, should remain a mere haven of refuge for oyster boats and coasting vessels. It is true, that even now, occasionally a large ship is forced in by stress of weather or inability to reach Baltimore. Its advantages are too manifest, its attractions too great to remain much longer neglected. It is here that the Allegany coal trade, coastwise and foreign, in its full development, (scarcely yet begun,) must seek its outlet; and where it can have ample accommodation for ten times its present amount. It is here that the city of Baltimore will find (what she so greatly needs,) an *outer* and *winter* port, giving her (what she now has not,) an uninterrupted communication with the ocean. This makes the Baltimore & Drum Point Rail Road emphatically a *Baltimore work*, scarcely less important to her than other great lines of improvement which she has so generously assisted, and from which, far beyond the dividends on her money investments, she derives so many advantages. It cannot be doubted that her interest and sagacity, (to say nothing of her necessities,) which have led her to embrace similar undertakings, will prompt her also to embark in this.

It has been asserted, upon reliable authority, that the cost to the city of Baltimore, *in various ways*, during the suspension of navigation by ice in the winter of 1867, would more than cover the cost of constructing our entire road, whilst she is liable to similar interruptions every recurring winter. If the above statement were susceptible of accurate analysis, I do not believe it would be found much, if any, exaggerated. Internal improvements build up great commercial cities, and this involves the problem of cheap food for their population, which constantly presses on them, for upon these means of communication they must mainly depend for their daily food and winter fuel. New York draws her subsistence from many States, and even from the dominion of Canada. London not only consumes the surplus productions of the three kingdoms, but lays under contribution half the continent.

The amount of food, saying nothing of luxuries, necessary

to keep the population of a large city above starvation point, is almost incredible, much of which must be of daily supply, and does not admit of accumulation. Baltimore derives no inconsiderable portion of her marketing (and even fuel) from the Chesapeake and its numerous tributaries, as is shown by the fact that when these avenues are closed, prices immediately advance. It would be a curious matter of investigation to ascertain what would be the loss to the city in one week, on these two items alone, leaving out of view the sufferings entailed on the very poor. As she is rapidly increasing in wealth, resources and population, the question of subsisting her people, cannot with safety long be evaded. Her sources of supply for the necessities of life, with even her present population, are very limited, unless she seeks for them in remote regions, and at high prices. It is alike her duty and interest to seek for them nearer home, and if she does, she can find them to a great extent in the beautiful "*Peninsula*" of Maryland—that district of country lying south of the Washington Rail Road, and washed by the waters of the Potomac River and Chesapeake Bay, comprising five counties, which, in soil, climate, capabilities of production, and character of its people, will compare favorably with any other portion of our country. But to fully avail herself of these resources, other communications than those now existing must be established.

The building of railroads in that region would introduce more (skilled) labor, capital, a better (because more remunerative) cultivation, encourage enterprise and stimulate industry, and develop its latent resources. The whole of this section with few exceptions was, before the manumission of the slaves, (involving the owners in an immense loss of capital and the *command* of labor,) well cultivated and remarkably productive, not inferior in those respects to the most favored portions of the Atlantic slope of the United States, for it was a great mistake to assume that slave labor, when intelligently guided and judiciously applied, was either slovenly or unproductive. As neat farming might have been seen in the Maryland Peninsula, (nor would they have been merely exceptional cases,) as in any part of the whole land, and for the very good reason that nowhere could have been found a more intelligent, industrious, or better educated body of land owners, more alive to their own interest, or more ready to accept recent and valuable improvements in their agricultural practice.

This district of our State, to which I have thus briefly alluded, was naturally rich, and as a general rule, was not allowed to become exhausted, although sometimes it must be admitted, the negligence of the proprietors permitted them to run down whilst the means of renovation were close at

hand, without resorting to costly foreign manures, which were indeed but little used, nor were they absolutely necessary, as the soil could generally be improved by judicious cultivation, proper alternation of crops, and the annual application of clover seed and plaster, or occasionally of lime, without the labor of digging from below the surface, the rich deposits of natural fertilizers with which nearly the whole country abounds, it being underlaid throughout nearly its whole extent, with either calcareous marl, or green sand, both of them being sometimes in close proximity with each other. This green sand or "New Jersey Marl," as it is sometimes called, is a "Silicate of Potash," probably the best known manure for tobacco, and the cereals, especially for wheat, the silex after, or rather during the decomposition of the salt by natural chemistry, entering into the growth of straw to which it imparts strength and vigor, whilst the potash furnishes food for the formation of the grain. Tobacco being a potash plant also derives great advantage from its application. Traces of this deposit are found almost everywhere, on or near the surface, in the ravines, and where the roads are cut through the hills. I have seen it in beds 20 feet deep, and of unknown extent.

It will be observed that in pressing this work on the attention of Baltimore, I have confined myself mainly to the consideration of obtaining additional means of subsisting her constantly increasing population, which is certainly (important as it is in itself) but a subordinate view of the subject. Its great interests are those of trade with foreign countries, and especially with the Southern States. But the vast importance of having a free and unimpeded communication with the ocean at all times, is so obvious that I have said but little about it. It is contended by some persons (it must be admitted of limited views) that the opening of direct railroad communication with the Patuxent harbor might build up a rival to the city of Baltimore at that place, and interfere with her coal trade. As a natural consequence, a considerable town would spring up at Drum Point; but it would always remain simply an auxiliary to our commercial emporium; and as it regards the coal trade, there is not room for it on the shore of the Baltimore Basin, (saying nothing of the difficulty of access to it for large vessels, for many reasons,) as compared with the mouth of the Patuxent and the restricted water surface of the basin itself, which will in time be occupied to its full capacity with a much more valuable commerce. As it is now and must be hereafter, it is beyond accommodating the wants of the city, a mere place of deposit, and therefore of no great consequence to her prosperity. If the coal trade from the Cumberland Fields is to be limited to Baltimore for its exportation, it can never reach to a tenth of its natural development.

In truth, scarcely a public work of any kind, not even a bridge or turnpike road can be constructed within the boundaries of Maryland that does not, or may not, directly or indirectly, inure to the benefit of Baltimore; and as she increases in wealth and population, the relations existing between her and the counties become more intimate and mutually dependent, the latter sharing in her prosperity as they would in her misfortunes. This, indeed, may be said to be the true position occupied by the different portions of the State towards its great commercial emporium, which, like the heart of the human body, elaborates the *life blood*, that in its circulation carries health, strength and energy to the extremities of the system.

The Baltimore and Ohio Rail Road Company, with the intelligence and sagacity which have for so long a period characterized the administration of its affairs, is now vigorously prosecuting the construction of a railroad—The *Metropolitan*—from the Point of Rocks to Washington City, with the intention of prolonging it from near Rockville, Montgomery county, where it suddenly tends to the South, to the Laurel Station, on the Washington Branch. This will save distance and time in running the fast trains to and from the West, avoiding the “roundabout way” of the Patapsco and Monocacy, and the high grades on that route; in fact, turning, instead of overcoming, the formidable barrier of “Parr’s Spring Ridge.” Besides these considerations, this cross road will greatly relieve the eastern portion of the Baltimore and Ohio from the pressure of freight, giving to it additional means of exit at tide water. The eastern connection of the Metropolitan Road may, perhaps, after all be at the Annapolis Junction; but there will be no physical difficulty in establishing our direct communication with the Laurel Depot, if it should be found desirable. In either case loaded cars reaching the junction will not be more than 30 miles further from Patuxent Harbor than from Locust Point on the Baltimore Basin.

Now when we consider the manifold advantages presented by the former, to so cumbrous a trade as that of coal, requiring so much room for its accommodation, it is not difficult to predict which destination it will seek; for trade like water will follow its natural channels. The mere local demand along the line of railroad for that article, would become quite important, as the forests are rapidly disappearing, and the high price of labor, would render coal delivered at convenient distances, cheaper than wood cut and hauled on the farm where it is consumed. Even now, it is as a matter of economy as well as comfort, hauled from four and five miles from navigable waters. Besides this, much of the land is too valuable to remain in wood, when a cheap substitute for it can

be obtained. The introduction of a more general use of coal, would greatly increase the area of cultivated lands, and add to the agricultural wealth of the country.

The article of lime will become no unimportant item of freight, for it acts like a charm on our lands, producing almost marvellous effects; and it might be furnished in large quantities and of good quality from Frederick and Washington counties at reasonable rates.

The population of Calvert county is supposed to be at this time about 10,000, more than half of which is black. Nearly all its trade and intercourse are with Baltimore, and yet probably no other county in the State is so unfortunately situated in regard to both these purposes. Along the bay coast, extending from the Anne Arundel boundary, to the mouth of the Patuxent, there is not a single steam boat landing, nor a harbor where sail vessels may lay in safety, nor where a wharf can stand the fury of the storms that sometimes prevail. Plum Point is the only place where steamers pretend to land, or to receive passengers and freight, and that in yawl boats in an open sea, often so rough as to make it impossible to do either. And in the winter, when the Patuxent is frozen above Solomon's Island, and for long periods there is no means of reaching Baltimore, except overland to the Annapolis and Elk Ridge Rail Road. This renders the position often one of great isolation, and then her mercantile supplies in Spring and Autumn, and her productions shipped from or to the landings on the river, have to be hauled in some instances, the distance of eight miles, over infamously bad roads. It is not therefore surprising that her people should be much discouraged and her resources so slightly developed, for she is really rich in all the elements that under more favorable circumstances would render them rich and happy, and add to the prosperity of the State at large.

The people of Calvert are, as a general rule, intelligent, honest, kind-hearted, as industrious and enterprising, as might be expected from the discouraging conditions under which they live, and of unbounded hospitality. Whilst they have borne their share, rather more than their fair share, all things considered, of the public burdens so rich in blessings to other portions of the State, they have absolutely received nothing in return. I will answer for it that these people will extend a kind and open-handed welcome to all respectable strangers, from any part of the country, who might desire to settle amongst them.

As our line occupied the crest of the ridge, it necessarily passed over much of the poorer portions of Calvert, but, nevertheless, traversed many fine farms, as in the neighborhood of All Saints Church, Prince Frederick and Port Re-

public; the land near Point Patience is very fertile. This country has always been celebrated for the fine quality of its tobacco, in that respect excelling all the other tobacco counties of Maryland, as it has sometimes exceeded them in the monied value of the annual crops, whilst on the richer lands the yield per acre has been very large, sometimes amounting to two thousand pounds.

This region seems to me admirably calculated for the cultivation of all the fruits produced in our country. Never have I seen larger, fairer and more delicious apples, or more perfect quinces; and yet the trees are merely planted, while it is left to nature to do the rest. Apples have been taken North by visitors, where they have borne off the highest prizes at pomological exhibitions. The plum also does well, whilst the peach, although but little cultivated, may be said to be almost indigenous, as it is seen growing wild nearly everywhere, self-propagated, yet free from disease, and bearing prodigious crops of inferior fruit, but better, it is said, for preserving and drying, than those of higher quality for the table. Here the grape, in all the varieties that have been tested, seems to find a most congenial soil and propitious climate. This remark is especially applicable to the Concord, which flourishes most luxuriantly, often on the poorest lands, with but little care, is quite healthy and very productive, and superior in flavor to any of that kind I have tasted elsewhere. I can see no good reason why Calvert county should not become one of the greatest fruit and wine districts east of the Alleghanies; on the contrary, there is abundant cause to believe that in a few years, when attention has been attracted to her capabilities, she may become one vast orchard and vineyard.

The climate is mild, equable and healthy, with the exception of a few localities. In some winters vegetation is not killed by frost. A gentleman told me that, on one occasion, his tobacco beds being deficient, he had actually planted from the suckers of the preceding year. This would seem to indicate an almost intertropical climate, but it must be remembered that it was an exceptional instance. I refer to it only to show that winters are often (not always) very mild, occasionally, once in many years they are quite rigorous.

It must not be supposed that Calvert county, chiefly agricultural as she is, is altogether destitute of mineral resources. It is known that a large deposit of iron ore has been found near Port Republic, of indefinite extent, pronounced by scientific men, and also by practical iron masters, as rich in percentage of metal, and producing iron of a fine quality. The ore is very abundant and easily accessible. The opening of the railroad would at once bring these valuable beds into active operation.

After a careful perusal of the statements in this report and duly weighing them, I think most persons will agree in thinking that the Baltimore & Drum Point Rail Road ought to be, and will be constructed; and that I have satisfactorily answered the question, "Will it be a paying road?" Looking to the various sources of revenue enumerated in the foregoing report, I can entertain no doubt that this work, considering the comparatively cheap cost at which it may be built, will yield a fair return, in dividends, for the money expended on its construction.

But he who would measure the utility of a public work by its revenue alone, would take a narrow and most illiberal view of the subject. No man can estimate, with even tolerable precision, the advantages which result from a judicious system of Internal Improvements; for the benefits they confer on the public at large are so ramified, complex and widely diffused, and frequently so silent in their operations, that it is almost impossible fully to appreciate them or to submit them to a rigid analysis. The statesman and the political economist justly regard them as the powerful instruments by which the condition of mankind has been ameliorated, the natural resources of the world developed, and distant nations, formerly separated by jealous rivalries, are united in the bonds of common interest.

During the whole period of our field operations, we were the recipients of so much assistance, kindness and hospitality, that if I were to attempt to offer individual acknowledgments without being invidious, I should be compelled to name nearly the entire population living near our line of survey.

In conclusion, it affords me great pleasure to say that the Commissioners have, on all occasions, extended to me their cordial co-operation. Messrs. Welch and Briscoe gave up much of their time during the progress of the survey, and in various ways rendered most valuable assistance.

Respectfully, sir,

Your obedient servant,

GEO. W. HUGHES,

Chief Engineer.

I neglected to state in the proper place, that the most facile communication between Baltimore and Norfolk, and of course further South, for the transmission of the mails and passengers, will be by the Baltimore & Drum Point Rail Road.

We are indebted to Capt. V. Stamp, Civil Engineer, for the beautiful and artistic drawings accompanying this report.

